

In the Claims

This listing of claims will replace all prior versions and listings of claims in this application.

1 (Currently amended). A sensor for the detection of an analyte, which comprises a holographic element comprising a medium and a hologram disposed throughout the volume of the medium, wherein the medium contains pores, wherein an optical characteristic of the hologram changes as a result of a variation of a physical property occurring throughout the volume of the medium, wherein the medium is obtainable by formation *in situ* in the presence of a pore-forming agent, wherein the agent is not present in the sensor or does not react with the analyte and the sensor; and wherein said medium comprises groups that interact with an analyte thereby causing a variation in a physical property of the medium.

2 (Previously presented). The sensor according to claim 1, wherein the physical property is the size of the medium.

3 (Previously presented). The sensor according to claim 1, wherein the optical characteristic is the reflectance, refractance or absorbance of the holographic element.

4 (Previously presented). The sensor according to claim 1, wherein the agent is a gas.

5 (Previously presented). The sensor according to claim 1, wherein the agent is a liquid.

6 (Previously presented). The sensor according to claim 1, wherein the agent is water.

7 (Previously presented). The sensor according to claim 1, wherein the agent is a solid obtainable by extraction of the agent after the formation.

8 (Previously presented). The sensor according to claim 1, wherein the medium is a polymer obtainable by the polymerization of monomers *in situ*.

9 (Previously presented). The sensor according to claim 8, wherein the monomers include hydroxyethyl methacrylate.

10 (new). A method for preparing a sensor for the detection of an analyte, wherein said sensor comprises a holographic element comprising a medium and a hologram disposed throughout the volume of the medium, wherein the medium contains pores, wherein an optical characteristic of the hologram changes as a result of a variation of a physical property occurring throughout the volume of the medium; wherein said method comprises the formation of said pores, *in situ*, in the presence of a pore-forming agent, and wherein the agent is not present in the sensor or does not react with the analyte and the sensor.

11 (new). A method of detecting an analyte wherein said method comprises the use of a sensor that comprises a holographic element comprising a medium and a hologram disposed throughout the volume of the medium, wherein the medium contains pores, wherein an optical characteristic of the hologram changes as a result of a variation of a physical property occurring throughout the volume of the medium, wherein the medium is obtainable by formation *in situ* in the presence of a pore-forming agent, wherein the agent is not present in the sensor or does not react with the analyte and the sensor; and wherein said method of detection comprises contacting said sensor with a sample suspecting of containing the analyte and determining whether the variation of a physical property occurs.